

PERSONAL DATA Institute of Applied Mathematics  
Middle East Technical University, Ankara, TURKEY  
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E-mail : yucelh@metu.edu.tr  
Date of Birth : October 12, 1984  
Place of Birth : Çorum, TURKEY  
Citizenship : Turkish (TC)

RESEARCH INTERESTS PDE constrained optimization (optimal control), Discontinuous Galerkin methods, Adaptive finite element methods

EDUCATION Middle East Technical University, Ankara, TURKEY  
  
Ph.D., Scientific Computing Program, Institute of Applied Mathematics, July 2012,  

- Dissertation Title: *"Adaptive Discontinuous Galerkin Methods For Convection Dominated Optimal Control Problems"*
- Advisor: Prof. Dr. Bülent Karasözen

  
B.S., Department of Mathematics, June 2007

RESEARCH VISITS  
  
September 2010-June 2011, Department of Computational and Applied Mathematics, Rice University, Houston, USA  

- supervised by Prof. Dr. Matthias Heinkenschloss
- supported by 2214-International Doctoral Research Fellowship Programme, Turkish Scientific and Technical Research Council (TÜBİTAK)

  
October 2008-December 2008, Department of Mathematics, Technische Universität Darmstadt, GERMANY  

- supervised by Prof. Dr. Stefan Ulbrich
- supported by project: Optimization Theory, Methods and Applications, subject-related partnerships with universities in developing countries, German Academic Exchange Service (DAAD)

EMPLOYMENT Middle East Technical University, Ankara, TURKEY  
  
April 2017- Assistant Professor  
Institute of Applied Mathematics  
  
Middle East Technical University, Ankara, TURKEY

July 2016-August 2016 Part-time Lecturer  
Department of Mathematics  
February 2016-June 2016 Part-time Lecturer  
Institute of Applied Mathematics

TED University, Ankara, TURKEY

February 2016-June 2016 Part-time Lecturer  
Basic Science Unit

Max Planck Institute for Dynamics of Complex Technical Systems,  
Magdeburg, GERMANY

October 2012-September 2015 Postdoctoral Researcher  
Computational Methods in Systems  
and Control Theory

Middle East Technical University, Ankara, TURKEY

September 2007-September 2012 Research Assistant  
Department of Mathematics  
April 2007-June 2007 Student Assistant  
Institute of Applied Mathematics

AWARDS

"Thesis of the Year Award", Middle East Technical University, Ankara, TURKEY,  
2013

Turkish Scientific and Technical Research Council (TÜBİTAK)

October 2007-July 2012 2211-Doctorate Scholarship

September 2011 2224-Travel Award

September 2010-June 2011 2214-International Doctoral Research Fellowship

German Academic Exchange Service (DAAD) Scholarship, October-December  
2008

LANGUAGE  
SKILLS

Turkish (native), English (fluently), German (B1)

COMPUTER  
SKILLS

Proficient in Matlab, C, C++, Latex, Linux/UNIX  
Working Knowledge of Java, Fortran, HTML, SQL

PUBLICATIONS

**Journal Articles Published/Accepted:**

- P. Benner, and H. Yücel, *Adaptive symmetric interior penalty Galerkin method for boundary control problems*, SIAM Journal on Numerical Analysis 55(2), 1101–1133, 2017, doi:10.1137/15M1034507.

- M. Uzunca, T. Küçükseyhan, H. Yücel, and B. Karasözen, *Optimal Control of Convective FitzHugh-Nagumo Equation*, Computers & Mathematics with Applications 73(9), 2151–2169, 2017, doi:10.1016/j.camwa.2017.02.028.
- H. Yücel, M. Stoll, and P. Benner, *A discontinuous Galerkin method for optimal control problems governed by a system of convection-diffusion PDEs with nonlinear reaction terms*, Computers & Mathematics with Applications 70(10), 2414-2431, 2015, doi:10.1016/j.camwa.2015.09.006.
- H. Yücel, and P. Benner, *Adaptive discontinuous Galerkin methods for state constrained optimal control problems governed by convection diffusion equations*, Computational Optimization and Applications 62(1), 291-321, 2015, doi:10.1007/s10589-014-9691-7.
- Z. K. Seymen, H. Yücel, and B. Karasözen, *Distributed optimal control of time-dependent diffusion-convection-reaction equations using space-time discretization*, Journal of Computational and Applied Mathematics (261), 146-157, 2014, doi:10.1016/j.cam.2013.11.006.
- T. Akman, H. Yücel, and B. Karasözen, *A priori error analysis of the upwind symmetric interior penalty Galerkin (SIPG) method for the optimal control problems governed by unsteady convection diffusion equations*, Computational Optimization and Applications (57), 703-729, 2014, doi:10.1007/s10589-013-9601-4.
- H. Yücel, and B. Karasözen, *Adaptive Symmetric Interior Penalty Galerkin (SIPG) method for optimal control of convection diffusion equations with control constraints*, Optimization (63), 145-166, 2014, doi:10.1080/02331934.2013.801474.
- H. Yücel, M. Stoll, and P. Benner, *Discontinuous Galerkin finite element methods with shock-capturing for nonlinear convection dominated models*, Computers & Chemical Engineering (58), 278-287, 2013, doi:10.1016/j.compchemeng.2013.07.011.

#### Journal Articles in Review:

- P. Benner, and H. Yücel, *A local discontinuous Galerkin method for Dirichlet boundary control problems*. Submitted 2017.
- H. Yücel, M. Stoll, and P. Benner, *Adaptive discontinuous Galerkin approximation of optimal control problems governed by transient convection-diffusion equations*. Submitted 2016.
- M. Stoll, and H. Yücel, *Symmetric Interior Penalty Galerkin Method For Fractional-In-Space Allen-Cahn Equations*. Submitted 2016.
- B. Karasözen, M. Uzunca, Ayşe Sarıaydın-Filibelioglu, and Hamdullah Yücel, *Energy Stable Discontinuous Galerkin Finite Element Method for the Allen-Cahn Equation*. Submitted 2016.

#### Conference Proceedings (Refereed) Published:

- H. Yücel, and P. Benner, *Distributed Optimal Control Problems Governed by Coupled Convection Dominated PDEs with Control Constraints*, in Assyr Abdulle, Simone Deparis, Daniel Kressner, Fabio Nobile, and Marco Picasso: Numerical Mathematics and Advanced Applications - ENUMATH 2013, Lecture Notes in Computational Science and Engineering, Springer International Publishing, 469-478, 2015, doi:10.1007/978-3-319-10705-9\_46.
- B. Karasözen, and H. Yücel, *Optimal Control of Diffusion-Convection-Reaction Equations Using Upwind Symmetric Interior Penalty Galerkin (SIPG) Method*, in Stavros G. Stavrinides, Santo Banerjee, Suleyman Hikmet Caglar, Mehmet Ozer: Chaos and Complex Systems, Springer Berlin Heidelberg, 83-94, 2013, doi:10.1007/978-3-642-33914-1\_11.
- H. Yücel, M. Heikenschloss, and B. Karasözen, *Distributed Optimal Control of Diffusion-Convection-Reaction Equations Using Discontinuous Galerkin Methods*, in Andrea Cangiani, Ruslan L. Davidchack, Emmanuil Georgoulis, Alexander N. Gorban, Jeremy Levesley, Michael V. Tretyakov: Numerical Mathematics and Advanced Applications 2011, Springer Berlin Heidelberg, 389-397, 2013, doi:10.1007/978-3-642-33134-3\_42.

SCIENTIFIC  
MEETINGS

#### Research Talks:

##### 2016

- *Adaptive Discontinuous Galerkin Methods for Optimal Control Problems*, Department of Mathematics, Atılım University, Ankara, December 14, 2016.
- *Numerical simulation of MHD duct flow problems using BEM and DGFEM approaches*, International Conference on Boundary Element and Meshless Techniques - BETEQ 2016, Ankara, July 11-13, 2016.

##### 2015

- *Space-Time Discontinuous Galerkin Finite Element Approximation of Optimal Control Problems*, ENUMATH 2015 Conference, Ankara, September 14-18, 2015.
- *Fractional Allen-Cahn Equations*, 26th Biennial Numerical Analysis Conference, Glasgow, June 23-26, 2015.
- *Adaptive Symmetric Interior Penalty Galerkin Method for Boundary Control Problems*, Workshop on Numerical Methods for Optimal Control and Inverse Problems, München, March 09-11, 2015.

##### 2014

- *Adaptive discontinuous Galerkin methods for convection dominated optimal control problems*, Lothar-Collatz-Seminar, Hamburg, December 16, 2014.
- *Unsteady optimal control problems arising from chemical processes*, 4th European Seminar on Computing (ESCO 2014), Pilsen, June 15 - 20, 2014.
- *Adaptive discontinuous Galerkin approximation of optimal control problems governed by transient convection-diffusion equations*, International Conference on Applied Mathematical Optimization and Modelling (APMOD Conference 2014), Coventry, April 9-11, 2014.
- *Adaptive discontinuous Galerkin approximation of optimal control problems governed by transient convection-diffusion equations*, Workshop on Numerical Methods for Optimal Control and Inverse Problems, Munich, March 03-05, 2014.

### 2013

- *Convection dominated optimal control problems arising from chemical processes*, Center Dynamic Systems (CDS): Biosystems Engineering, CDS Status Seminar, Magdeburg, November 20, 2013.
- *Optimal control problems governed by a system of convection-diffusion PDEs with nonlinear reaction terms*, Institute of Applied Mathematics, METU, Ankara, October 1, 2013.
- *Distributed optimal control problems governed by coupled convection dominated PDEs with control constraints*, ENUMATH 2013 Conference, Lausanne, August 26-30, 2013.
- *Adaptive discontinuous Galerkin (DG) methods for state constrained optimal control problems governed by convection dominated equations*, European Conference on Computational Optimization (EUCCO), Chemnitz, July 17-19, 2013.
- *Optimal control problems governed by a system of convection-diffusion PDEs with nonlinear reaction terms*, Workshop on Numerical Methods for Optimal Control and Inverse Problems, Munich, March 11-13, 2013.

### 2012

- *Adaptive discontinuous Galerkin methods for advection dominated optimal control problems*, International Research Training Group IGDK, TU Munich, Munich, July 13, 2012.
- *Adaptive discontinuous Galerkin methods for advection dominated optimal control problems*, Colloquium of the Modeling, Numerics, Differential Equations Group, TU Berlin, Berlin, June 12, 2012.

- *Adaptive discontinuous Galerkin methods for advection dominated optimal control problems*, Mathematical Optimization and Applications in Biomedical Sciences, Karl-Franzens-Universitt, Graz, March 23, 2012.

### 2011

- *Distributed optimal control of diffusion-convection-reaction equations using discontinuous Galerkin methods*, ENUMATH 2011 Conference, Leicester, September 5-9, 2011.

### 2009

- *Distributed optimal control of unsteady Burgers and convection-diffusion-reaction equations using COMSOL Multiphysics*, Computational Techniques for Optimization Problems subject to Time-Dependent PDEs, Brighton, December 14-16, 2009.

### Participation in International Scientific Meetings:

- Finite Element Rodeo 2011, College Station, Texas, February 25-26, 2011.
- Winterschool on Hierarchical Matrices, Max-Planck-Institute for Mathematics in the Sciences, Leipzig, March 2-6 2009.

### TEACHING EXPERIENCE

#### Middle East Technical University, Ankara, TURKEY

##### Lecturer

- IAM 572 Finite Element Methods for Partial Differential Equations: Theory and Applications, Spring 2017
- IAM 590 Graduate Seminar, Spring 2017
- IAM 765 Special Topics: Advances topics in Finite Elements, Spring 2016
- Math 120 Calculus of Functions of Several Variables, Summer 2016

##### Teaching Assistant

- MATH 119 Calculus With Analytic Geometry Functions, Fall 2007, Spring 2009, 2010
- MATH 120 Calculus for Functions of Several Variables, Spring 2008
- MATH 219 Introduction to Differential Equations, Fall 2009, 2011
- MATH 250 Advanced Calculus in Statistics, Spring 2012

- MATH 254 Introduction to Differential Equations, Spring 2012
- MATH 480 Numerical Methods for Differential Equations, Spring 2009, 2010

**TED University**, Ankara, TURKEY

Lecturer

- Math 102 Multivariable Calculus, Spring 2016
- Math 112 Introduction to Multivariable Calculus and Linear Algebra, Spring 2016

SUPERVISED  
STUDENTS

- MSc Thesis
  - Özgün Murat Arslantaş (Co-Advisor)
    - \* **Institution** : Scientific Computing Program, Institute of Applied Mathematics, Middle East Technical University, Ankara, TURKEY
    - \* **Year** : June 2015
    - \* **Title** : Multigrid Methods for Optimal Control Problems Governed by Convection-Diffusion Equations
- Interns (Max Planck Institute)
  - Özgün Murat Arslantaş
    - \* **Institution** : Middle East Technical University, Ankara
    - \* **Visiting Period** : April 2014 - June 2014
    - \* **Title** : Multigrid Methods for Convection Dominated Optimal Control Problems
  - Ulviyya Ibrahimli
    - \* **Institution** : Middle East Technical University, Ankara
    - \* **Visiting Period** : July 2013 - September 2013
    - \* **Title** : Implementation of Discontinuous Galerkin Methods

ACADEMIC  
MEMBERSHIPS

Society for Industrial and Applied Mathematics (SIAM)  
The Continuous Optimization Working Group of EURO (EUROPT)

REFERENCES

References available upon request.